

WHAT IS CLAIMED IS:

1 1. A CDMA receiver capable of detecting a pilot channel
2 signal having a known pseudo-random noise (PN) chip sequence, said
3 known PN chip sequence comprising a plurality of known Logic 1
4 chips and a plurality of known Logic 0 chips, said CDMA receiver
5 comprising:

6 a memory capable of storing said pilot channel signal as
7 a first original sequence of chip samples;

8 a pseudo-signal generator capable of re-ordering selected
9 ones of said first original sequence of chip samples to thereby
10 generate a first re-ordered sequence of chip samples, wherein said
11 pseudo-signal generator combines said original sequence of chip
12 samples with said first re-ordered sequence of chip samples to
13 thereby generate a first pseudo-signal sequence of combined chip
14 samples;

15 a first matched filter capable of computing a first
16 correlation value indicating a relative correlation between said
17 first pseudo-signal sequence of combined chip samples and said
18 known PN chip sequence; and

19 a decision circuit capable of determining from said first
20 correlation value if said pilot channel signal has been detected.

1 2. The CDMA receiver as set forth in Claim 1 wherein said
2 pseudo-signal generator is further capable of re-ordering selected
3 ones of said original sequence of chip samples to thereby generate
4 a second re-ordered sequence of chip samples, wherein said pseudo
5 signal generator combines said first pseudo-signal sequence of
6 combined chip samples with said second re-ordered sequence of chip
7 samples to thereby generate a second pseudo-signal sequence of
8 combined chip samples.

1 3. The CDMA receiver as set forth in Claim 2 wherein said
2 first matched filter computes a second correlation value indicating
3 a relative correlation between said second pseudo-signal sequence
4 of combined chip samples and said known PN chip sequence.

1 4. The CDMA receiver as set forth in Claim 3 wherein said
2 decision circuit determines from said second correlation value if
3 said pilot channel signal has been detected.

1 5. The CDMA receiver as set forth in Claim 1 wherein said
2 pseudo-signal generator generates from said first original sequence
3 of chip samples a first time-shifted original sequence of chip
4 samples and re-orders selected ones of said first time-shifted
5 original sequence of chip samples to thereby generate a first
6 time-shifted re-ordered sequence of chip samples, wherein said
7 pseudo-signal generator combines said first time-shifted original
8 sequence of chip samples with said first time-shifted re-ordered
9 sequence of chip samples to thereby generate a first time-shifted
10 pseudo-signal sequence of combined chip samples.

1 6. The CDMA receiver as set forth in Claim 5 further
2 comprising a second matched filter capable of computing a second
3 correlation value indicating a relative correlation between said
4 first time-shifted pseudo-signal sequence of combined chip samples
5 and said known PN chip sequence.

1 7. The CDMA receiver as set forth in Claim 6 wherein said
2 decision circuit determines from said second correlation value if
3 said pilot channel signal has been detected.

1 8. The CDMA receiver as set forth in Claim 1 wherein said
2 pseudo-signal generator re-orders said selected ones of said first
3 original sequence of chip samples by 1) determining a first
4 plurality of time slots, each of said first plurality of time slots
5 comprising a plurality of chip samples corresponding to Logic 1
6 chips, and a second plurality of time slots, each of said second
7 plurality of time slots comprising a plurality of chip samples
8 corresponding to Logic 0 chips, and 2) at least one of: a)
9 modifying an order of a first Logic 1 chip sample and a second
10 Logic 1 chip sample; and b) modifying an order of a first Logic 0
11 chip sample and a second Logic 0 chip sample.

1 9. The CDMA receiver as set forth in Claim 1 wherein said
2 CDMA receiver is disposed in a wireless mobile station comprising
3 one of a cellular telephone, a paging device, a wireless network
4 card, and their equivalents.

1 10. The CDMA receiver as set forth in Claim 1 wherein said
2 CDMA receiver is disposed in a fixed access terminal.

11. A wireless mobile station capable of communicating with a plurality of base stations in a wireless network, said wireless mobile station comprising a CDMA receiver capable of detecting a pilot channel signal having a known pseudo-random noise (PN) chip sequence, said known PN chip sequence comprising a plurality of known Logic 1 chips and a plurality of known Logic 0 chips, said CDMA receiver comprising:

a memory capable of storing said pilot channel signal as a first original sequence of chip samples;

a pseudo-signal generator capable of re-ordering selected ones of said first original sequence of chip samples to thereby generate a first re-ordered sequence of chip samples, wherein said pseudo-signal generator combines said original sequence of chip samples with said first re-ordered sequence of chip samples to thereby generate a first pseudo-signal sequence of combined chip samples;

a first matched filter capable of computing a first correlation value indicating a relative correlation between said first pseudo-signal sequence of combined chip samples and said known PN chip sequence; and

a decision circuit capable of determining from said first correlation value if said pilot channel signal has been detected.

12. The wireless mobile station as set forth in Claim 11 wherein said pseudo-signal generator is further capable of re-ordering selected ones of said original sequence of chip samples to thereby generate a second re-ordered sequence of chip samples, wherein said pseudo signal generator combines said first pseudo-signal sequence of combined chip samples with said second re-ordered sequence of chip samples to thereby generate a second pseudo-signal sequence of combined chip samples.

13. The wireless mobile station as set forth in Claim 12 wherein said first matched filter computes a second correlation value indicating a relative correlation between said second pseudo-signal sequence of combined chip samples and said known PN chip sequence.

14. The wireless mobile station as set forth in Claim 13 wherein said decision circuit determines from said second correlation value if said pilot channel signal has been detected.

1 15. The wireless mobile station as set forth in Claim 11
2 wherein said pseudo-signal generator generates from said first
3 original sequence of chip samples a first time-shifted original
4 sequence of chip samples and re-orders selected ones of said first
5 time-shifted original sequence of chip samples to thereby generate
6 a first time-shifted re-ordered sequence of chip samples, wherein
7 said pseudo-signal generator combines said first time-shifted
8 original sequence of chip samples with said first time-shifted
9 re-ordered sequence of chip samples to thereby generate a first
10 time-shifted pseudo-signal sequence of combined chip samples.

1 16. The wireless mobile station as set forth in Claim 15
2 further comprising a second matched filter capable of computing a
3 second correlation value indicating a relative correlation between
4 said first time-shifted pseudo-signal sequence of combined chip
5 samples and said known PN chip sequence.

1 17. The wireless mobile station as set forth in Claim 16
2 wherein said decision circuit determines from said second
3 correlation value if said pilot channel signal has been detected.

1 18. The wireless mobile station as set forth in Claim 11
2 wherein said pseudo-signal generator re-orders said selected ones
3 of said first original sequence of chip samples by 1) determining
4 a first plurality of time slots, each of said first plurality of
5 time slots comprising a plurality of chip samples corresponding to
6 Logic 1 chips, and a second plurality of time slots, each of said
7 second plurality of time slots comprising a plurality of chip
8 samples corresponding to Logic 0 chips, and 2) at least one of: a)
9 modifying an order of a first Logic 1 chip sample and a second
10 Logic 1 chip sample; and b) modifying an order of a first Logic 0
11 chip sample and a second Logic 0 chip sample.

1 19. The wireless mobile station as set forth in Claim 11
2 wherein said wireless mobile station comprises one of a cellular
3 telephone, a paging device, a wireless network card, and their
4 equivalents.

1 20. A method of detecting a pilot channel signal having a
2 known pseudo-random noise (PN) chip sequence, the known PN chip
3 sequence comprising a plurality of known Logic 1 chips and a
4 plurality of known Logic 0 chips, the method comprising the steps
5 of:

6 storing the pilot channel signal as a first original
7 sequence of chip samples;

8 re-ordering selected ones of the first original sequence
9 of chip samples to thereby generate a first re-ordered sequence of
10 chip samples;

11 combining the original sequence of chip samples with the
12 first re-ordered sequence of chip samples to thereby generate a
13 first pseudo-signal sequence of combined chip samples;

14 computing a first correlation value indicating a relative
15 correlation between the first pseudo-signal sequence of combined
16 chip samples and the known PN chip sequence; and

17 determining from the first correlation value if the pilot
18 channel signal has been detected.